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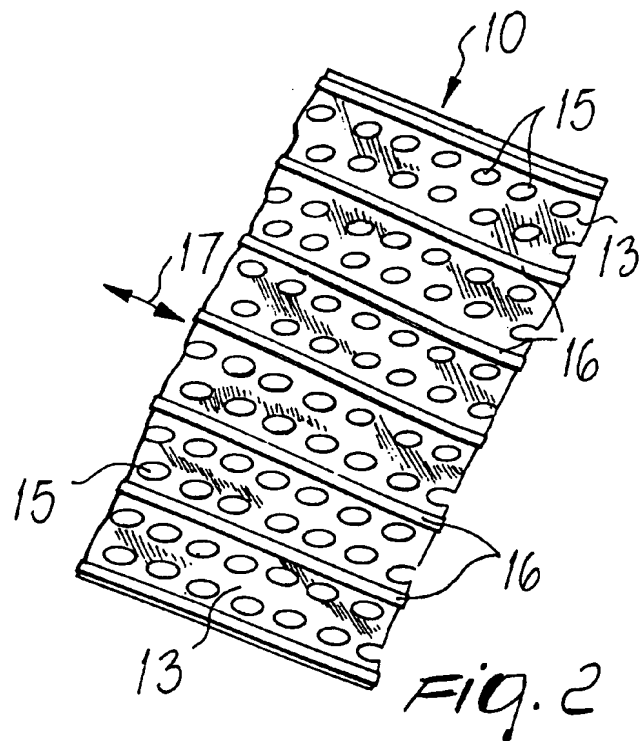
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(54) **Perforated extensible film for palletizing**

(57) A perforated extensible palletizing film (10) comprising a longitudinally elongated thin sheet (13) of extensible plastics provided with ventilation holes (15) and longitudinal reinforcement elements (16) which are made of extensible plastics and are adapted to increase the strength of the film in the pulling direction.



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Description

[0001] The present invention relates to a perforated extensible film for palletizing.

[0002] It is well-known that an extensible film is currently often used and wrapped around a group of products stacked so as to form a single block.

[0003] Products are in fact usually grouped and loaded onto a pallet so that they can be handled and stored more easily with a fork-lift truck which can lift the pallet with all the products loaded thereon.

[0004] A film, generally made of polyethylene, is used in performing these operations in order to prevent the products from being able to fall. The film is wrapped appropriately with two or three turns around the group of products so as to form a single block.

[0005] In particular, the need is felt for some products, such as fruit and vegetables, to avoid any overheating and to ensure some ventilation so that accelerated deterioration of the products does not occur.

[0006] Uniformly perforated polyethylene films are currently widely used for this purpose and are wrapped around a group of products, allowing their ventilation and transpiration.

[0007] The holes are generally formed in the extensible film, for example by heat or by punching, but must be large enough to still allow ventilation of the products after the film has been wrapped around the group of products with two or three turns.

[0008] Accordingly, it is better if the perforated surface is at least equal to 50% of the surface of the film.

[0009] A perforated polyethylene film is currently available which is subjected to stretching in one direction in order to increase its pulling strength in that direction.

[0010] The size of the holes is proportional to the degree of stretching.

[0011] In this manner, however, a film to be wrapped around products is obtained which has a good pulling strength but which is poorly extensible because of the stretching.

[0012] The consequence of this reduced extensibility is a reduced adaptability of the film to the particular configuration of each group of products to be assembled into a single block.

[0013] There are also simply perforated films which are more extensible than the preceding ones but on the other hand do not have a high pulling strength and the holes cause any pulling to produce uncontrolled tearings.

[0014] The aim of the present invention is to provide a perforated film to be used to wrap groups of products which can be extensible during use in order to solve the problems observed above in conventional films.

[0015] In relation to this aim, a particular object of the present invention is to provide a film which is extensible in the wrapping direction but ensures adequate pulling strength.

[0016] Another object of the present invention is to

provide a perforated extensible film for palletizing which can be obtained at a cost which is comparable to that of currently commercially available films.

[0017] Another object of the present invention is to provide a perforated extensible film for palletizing which can be manufactured with per se known methods and processes.

[0018] This aim, these objects and others which will become apparent hereinafter are achieved by a palletizing film constituted by a longitudinally elongated thin sheet made of extensible plastics provided with ventilation holes, characterized in that it comprises longitudinal reinforcement elements made of extensible plastics and adapted to increase the strength of said film in the pulling direction.

[0019] Further characteristics and advantages of the present invention will become apparent from the description of a preferred embodiment, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a group of products loaded onto a pallet and wrapped by a perforated extensible film according to the invention;

Figure 2 is a perspective view of a portion of a perforated extensible film for palletizing according to the invention;

Figure 3 is a perspective view of a roll of the film shown in Figure 2;

Figure 4 is a sectional view, taken along a transverse plane, of a detail of the film shown in Figure 2; Figure 5 is a sectional view, taken along a transverse plane, of a detail of another embodiment of a perforated extensible film for palletizing according to the invention;

Figure 6 is a sectional view, taken along a transverse plane, of a detail of another embodiment of a perforated extensible film for palletizing according to the invention.

[0020] With reference to the above cited Figures 1 to 4, a palletizing film according to the invention is generally designated by the reference numeral 10 and is preferably but not exclusively used to wrap a group of products, generally designated by the reference numeral 11, loaded onto a pallet 12.

[0021] The film 10 is constituted by a thin sheet 13 which is elongated mainly in a longitudinal direction.

[0022] Usually, the thin sheet 13 is made of polyethylene, but as an alternative it can be made of any other plastic material, provided that it has adequate mechanical characteristics.

[0023] Polyethylene is in any case preferable because it is fully recyclable and can be easily disposed of after use.

[0024] Generally, the thin sheet 13 is rolled up in rolls 14 for convenience in unrolling it and wrapping it for example around the group of products 11 so as to turn

it into a single block.

[0025] The thin sheet 13 is uniformly provided with holes 15 which in this case are substantially circular and are obtained for example by punching or by heat in a per se known manner.

[0026] The thin sheet 13 also has longitudinal reinforcement elements 16 which are parallel to each other and are adapted to increase the strength of the film 10 in the pulling direction, shown schematically by the arrow 17.

[0027] Each one of the reinforcement elements 16 is constituted by a strip 18, made of polyethylene in this case, which is conveniently joined to the thin sheet 13 by thermal bonding, gluing or other methods.

[0028] In this manner, although good strength of the film 10 in the pulling direction 17 continues to be ensured, the film 10 is capable of conveniently adapting to the shape of the product or group of products 11 around which it is wrapped, since good extensibility of the film continues to be ensured.

[0029] The joining of the strips 18 to the thin sheet 13 by thermal bonding can occur, for example, by providing a roll of polyethylene to be coupled, during production, to the roll 14 of the thin sheet 13 and by ensuring that during the unrolling of the rolls the strips 18 are cut and coupled by thermal bonding, gluing or other methods.

[0030] With reference to Figure 5, in a second embodiment a palletizing film is now designated by the reference numeral 110 and is constituted by a thin sheet 113 which is uniformly perforated and has reinforcement elements 116 which are obtained in this case by overlap folding of longitudinal portions of said thin sheet 113.

[0031] Conveniently, the folded and overlapped longitudinal portions of the thin sheet 113 are joined by thermal bonding, gluing or other methods so as to provide the reinforcement elements 116.

[0032] With reference to Figure 6, another embodiment of a perforated extensible film for palletizing is now designated by the reference numeral 210 and is constituted by a thin sheet 213 made of polyethylene or of another plastic material having adequate characteristics which is also uniformly perforated.

[0033] The thin sheet 213 has longitudinal reinforcement elements, now designated by the reference numeral 216, which are obtained by means of beads 217 which are made of polyethylene in this case, are formed by extrusion and are joined by thermal bonding, gluing or other methods to the thin sheet 213.

[0034] In a different embodiment, which is not shown in the above figures for the sake of simplicity, a perforated film for palletizing can be constituted by a thin sheet, made for example of polyethylene, which is uniformly provided with transverse slits (instead of holes 15) and with reinforcement elements which are fully similar to the reinforcement elements 16, 116 or 216 described above.

[0035] During the wrapping of said film, due to the traction that is applied, the slits widen so as to provide

openings which allow ventilation and transpiration of the products wrapped by said film.

[0036] In practice it has been found that the present invention fully achieves the intended aim and all the objects.

[0037] In particular, the present invention achieves an important advantage by virtue of the fact that a perforated film for palletizing has been provided which has good extensibility characteristics combined with good pulling strength.

[0038] Furthermore, the width of the holes can be defined at will and is not dependent on the degree of stretching.

[0039] It should also be noted that the reinforcement elements restrain the tendency of the holes to widen uncontrollably when the film is pulled and to tear it.

[0040] The resulting effect is a uniform and therefore optimum stretching of the film.

[0041] Another advantage is achieved in that a perforated extensible film for palletizing has been provided which can be manufactured with per se known methods and processes.

[0042] Another advantage is achieved in that a perforated extensible film for palletizing has been provided which can be manufactured at a cost which is comparable to that of commercially available conventional perforated films.

[0043] All the details may furthermore be replaced with other technically equivalent elements.

[0044] The materials used, so long as they are compatible with the contingent use, as well as the dimensions, may be any according to the requirements.

[0045] The disclosures in Italian Patent Application No. PD97A000226 from which this application claims priority are incorporated herein by reference.

[0046] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A palletizing film constituted by a longitudinally elongated thin sheet made of extensible plastics provided with ventilation holes, characterized in that it comprises longitudinal reinforcement elements which are made of extensible plastics and are adapted to increase the strength of said film in the pulling direction.
2. The palletizing film according to claim 1, characterized in that said reinforcement elements are constituted by strips of plastic material which are joined to the film.

3. The palletizing film according to claim 1, characterized in that said reinforcement elements are constituted by longitudinal portions of said film which are folded by overlapping and subjected to thermal bonding, glued or joined by means of another system. 5
4. The palletizing film according to claim 1, characterized in that said holes are formed by transverse slits. 10
5. The palletizing film according to claim 1, characterized in that said reinforcement elements are constituted by beads which are formed by extruding plastics and are joined by thermal bonding, gluing or other methods. 15
6. The palletizing film according to claim 1, characterized in that said film is made of polyethylene. 20
7. The palletizing film according to claim 2, characterized in that said strips are made of polyethylene.
8. The palletizing film according to claim 5, characterized in that said beads are obtained by extruding polyethylene. 25

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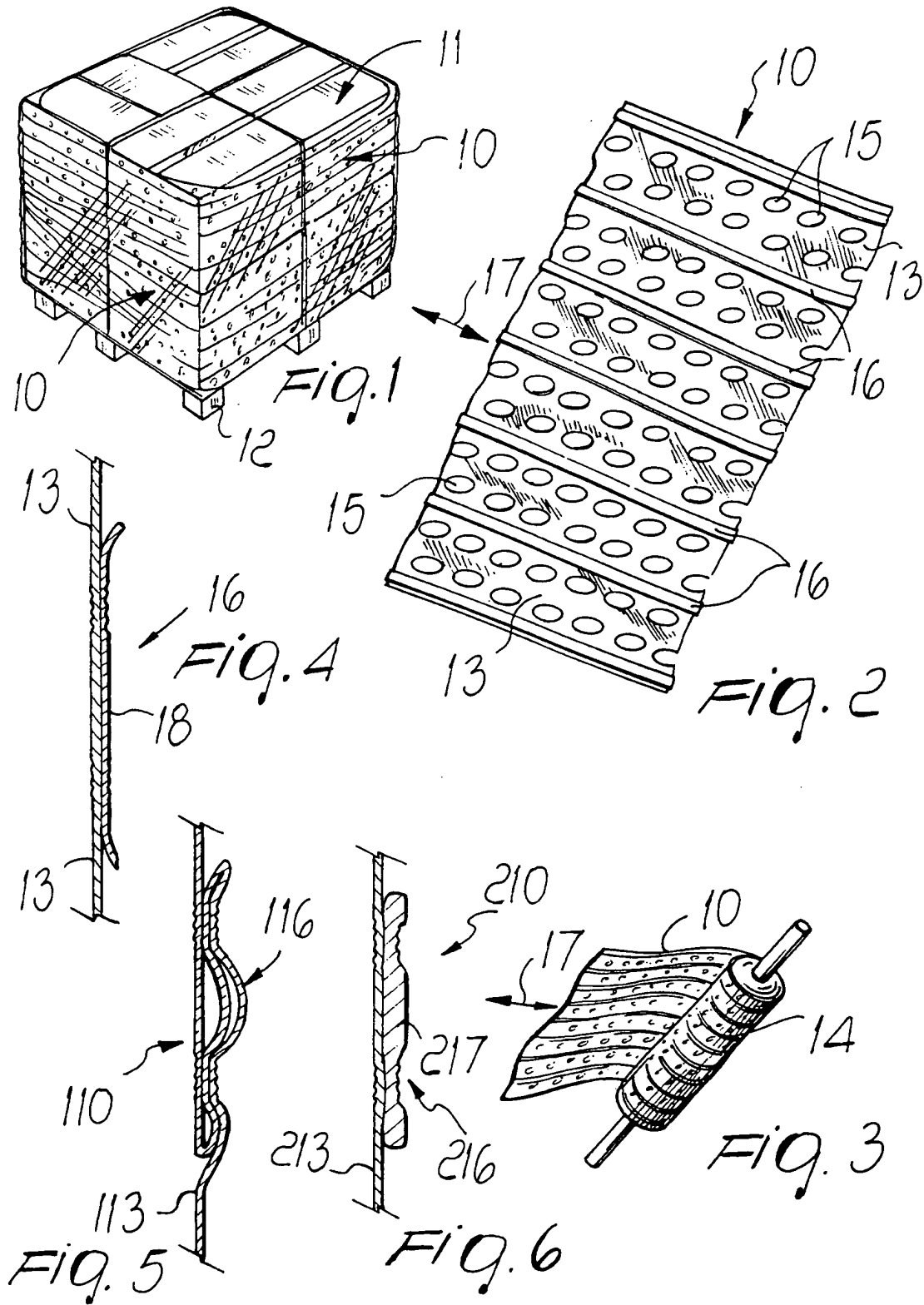
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EUROPEAN SEARCH REPORT

Application Number
EP 98 11 8333

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 January 1999	Examiner Vollering, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
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